CHRONIC WASTING DISEASE UPDATE

Wisconsin Department of Natural Resources **November 2006**

Ask DNR Secretary Scott Hassett about CWD

In this column, Department of Natural Resources Secretary Scott Hassett answers some of the many questions and concerns related to chronic wasting disease (CWD) in Wisconsin white-tailed deer.

As I've traveled around Wisconsin, I've heard over and over many of the same questions regarding the science behind CWD management. I covered some of these issues in my early columns written almost three years ago. Yet these questions are still relevant in 2006 and worth revisiting over the next couple columns. After discussing the 'old' science, I look forward in future columns to outlining some of the latest scientific information we have learned about CWD and will touch on some of the exciting research projects taking place in Wisconsin.

Why is it that we still have so many questions about CWD?

To say that we've been on a steep learning curve with CWD would be a real understatement. CWD is a difficult disease to study – it isn't caused by bacteria or a virus, but an abnormal protein. Progress is being made using specialized mice in experimental exposure studies. In Wisconsin, CWD is affecting a wild population – white-tailed deer – that every hunter knows has superb human avoidance skills. Additionally, there is a very long incubation period before an animal shows any signs of illness.

Frankly, before it was found in Wisconsin, it was viewed as a local problem out west. Until recently, the scientists and wildlife managers from around the country who were attempting to learn more about it were hamstrung by small budgets and staff shortages. Some of those problems continue but it's getting better. It wasn't until CWD jumped to Wisconsin that folks began clamoring for answers.

How do we know that CWD hasn't been in Wisconsin's wild deer herd all along?

We only began testing hunter-harvested deer for CWD in Wisconsin in 1999, but for several decades we followed up on reports of sick and dead Wisconsin wild white-tailed deer without detecting CWD.

Over the last four years we accomplished the most intensive CWD testing in the history of North American wildlife management. In total, we have sampled 100,296 deer statewide in an effort to get good information about where CWD is in our state.

Disease experts from the University of Wisconsin and the US Geological Survey's National Wildlife Health Center have been studying the pattern of CWD cases in southern Wisconsin. The large cluster of cases in western Dane and eastern Iowa counties surrounded by a sprinkling of cases on the perimeter are reminiscent of a wild fire in that there is an intense area with spot fires on the periphery. The same scenario is true in southern Rock and Walworth counties which are believed to be on the periphery of a disease outbreak centered in northern Illinois.

These patterns suggest a relatively recent introduction of the disease in both areas.

Why not just 'do nothing' and let nature take its course?

Some hunters suggest that there are deer with a genetic makeup that makes them resistant to CWD and, if CWD ran its course through the wild deer herd, surviving animals would form the basis of a herd that would be resistant to the disease.

A UW-Madison study published in the "Journal of Wildlife Disease," suggests that virtually all white-tailed deer in the area are genetically susceptible to CWD. A team of scientists and

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graduate students working under the direction of Judd Aiken, a professor of animal health and biomedical sciences at UW-Madison's School of Veterinary Medicine, conducted the study. Professor Aiken is a leading authority on diseases caused by prions, the nearly indestructible proteins that cause CWD.

The UW-Madison study examined DNA from 126 infected and uninfected deer harvested within the Disease Eradication Zone (DEZ) in 2002. The team sequenced the prion protein (PrP) gene from the DNA found in the cells of the deer. Although the function of the PrP protein is not completely understood, when an animal is exposed to the disease, the normal protein converts to an infectious, disease-causing form.

Almost all of the 126 deer studied had one of the forms of the gene that are found in infected animals.

In March 2006, a further analysis of PrP genes in wild Wisconsin deer, also under the direction of professor Aiken, was published in the "Journal of General Virology." This examination included a larger number of uninfected deer harvested statewide and infected deer from the CWD zones of Wisconsin The results suggest that 91–98 percent of white-tailed deer are genetically susceptible to CWD.

However, this study also identified deer with a rare gene type that appears to allow them to live a longer time after CWD infection. This can be interpreted as genetic partial resistance. There is concern that these deer may be able to transmit the disease for this longer period of time before they inevitably die.

Simulations of CWD's effects on deer populations also demonstrate that letting nature take its course would result in an increase in prevalence of the disease. The models also show a moderate to substantial long-term reduction in deer numbers. These simulations are consistent with recent findings in Colorado that have shown increases in prevalence in local populations, and early evidence suggestive of associated deer population decline.

In the final analysis, our goal is a healthy deer herd. Regardless of the model used, we are confident that a 'do nothing' approach will result in the disease spreading and prevalence increasing. That's why we are heading down the aggressive path that we have chosen. We will apply what we learn as each year goes by in the hope that we will ultimately reach our goal.

Research Update

A Meta-analysis of Hunter Support for Deer Population Reduction as a CWD Management Strategy

Since the discovery of CWD in Wisconsin, Bob Holsman, assistant professor at UW-Stevens Point, and DNR research scientist, Jordan Petchenik, have conducted nine surveys of hunters and landowners within the CWD zones of southern Wisconsin.

Now, with this wealth of survey data, they feel they are well on their way to understanding landowner and hunter satisfaction, motivation, willingness to harvest more deer and willingness to stay the course through a disease eradication effort.

Petchenik and Holsman have found that the majority of hunters support the goal of disease eradication and don't want to see CWD spread any further across the state.

In fact, 71 percent of respondents are willing to give the DNR at least three more years to fight the disease through herd reduction, with 37 percent agreeing to wait as long as it takes to find out if the plan is working.

Despite these statistics, data from three studies show that only 45 to 58 percent of landowner-hunters would be willing to shoot more deer on their property if they were confident that it would help eliminate CWD. In addition, the same three studies show that 84 to 95 percent of hunters don't believe in killing more deer than can be used, a value that Petchenik and Holsman claim is instilled in hunters beginning at a very young age.

Incentives used to increase harvest were also explored by several of these surveys. Most notably, monetary incentives that reward hunters and landowners for harvesting CWD-positive deer have not been effective for increasing harvest. In the southwest Disease Eradication Zone (DEZ), 72 percent of respondents claim that the Focus on Positives incentive program, which rewards hunters for taking CWD-positive animals off the landscape, had no influence on the number of deer they harvested.

Extended seasons do, however, seem to be an incentive that works to a certain degree. According to one of the surveys, hunters who are taking advantage of the extended seasons are harvesting more deer.

These surveys provide disease managers with invaluable insights into understanding hunter and landowner behavior as it relates to the disease management effort. Such understanding is essential to finding management strategies that will get us to the common goal of a healthy deer herd.

Empirical Studies of Deer Behavior in the Wild and Their Contribution to the Understanding of CWD Transmission

While hunting this fall, you may see deer fitted with radio collars. Please don't shoot these deer as they are part of a study being conducted by University of Wisconsin-Madison associate professor Nancy Mathews.

The study, which has been underway since September, 2002, is designed to assess the role that deer behavior plays in the spread of CWD.

For this study, 184 deer from the western DEZ, 112 females, 14 adult males and 58 fawn/yearling males, were fitted with radio collars to track their movement.

Mathews is observing the dispersal rates and distances as well as home range sizes for these deer. She is also observing the influence of hunter harvest on deer behavior and the effect of landscape features on their movement.

Preliminary results are indicating that females and adult males almost never disperse. So far, none of the adult males and only one out of the 112 females has dispersed. In contrast, 12 out of 35, or 34 percent, of yearling males have dispersed an average of 5.1 miles. Most yearling males disperse in the spring, but some wait until the rut, or breeding season.

These results suggest that, if infected at the time of dispersal, yearling males have the potential to spread the disease over a large geographic area. At a local scale, it's more likely that prions are spread among females within their matrilineal social groups and among males in their late summer bachelor groups through direct contact or contact with contaminated material in the environment. At this time it's not known how deer transmit the prions, but recent laboratory studies suggest that saliva is most likely involved.

Mathews and her collaborators are just beginning to investigate what role buck scrapes and rubs, as well as mineral licks, might play in the transmission of the disease.

Other studies have shown that deer will travel long distances outside of their home range to reach a source of minerals. Mineral licks, both man-made and natural, are used by deer of all ages throughout the spring, summer and fall of each year.

Spatial and Temporal Patterns of CWD

In this study, by University of Wisconsin assistant scientist Dr. Erik Osnas, trends in CWD prevalence are studied in relation to simple geographic models of disease spread over time.

By studying the prevalence of the disease in deer harvested in the CWD management zones, Osnas can estimate where incidence of the disease has increased and where it has decreased.

Models created by Osnas, based on data collected over the last four years, show that prevalence may be relatively stable or slightly decreasing in areas of high infection and may be increasing in outlying areas where prevalence is low.

These models add to disease managers' understanding of how the distribution and intensity of CWD infection in Wisconsin's wild deer herd is changing. This may allow managers to test the efficacy of control efforts.

Regarding the observed changes in prevalence, Osnas said, "Even under successful disease eradication, geographic spread is expected after the initiation of control efforts, at least for the short-term. Control efforts in these outlying areas where prevalence is low and the disease has recently been discovered are especially important."

The Potential Role of Feeding Deer in the Transmission of Infectious Disease

This study examined the role of supplemental feeding or baiting of deer in transmitting disease. It was conducted by University of Wisconsin graduate student Abbey Thompson and supervised by professors Michael Samuel and Tim Van Deelen in the Department of Wildlife Ecology.

At Sandhill Wildlife Demonstration Area during the winters of 2003-04 and 2004-05, six commonly used feeding practices were rotated through four supplemental feeding stations.

Shelled corn with molasses was provided in piles, scattered on the ground or in troughs at a rate of either ten gallons/day or two gallons/day. Natural feeding areas were also monitored as controls for the study.

Using photos taken with motion sensing cameras, researchers documented the potential for direct disease transmission through deer-to-deer contact and indirect transmission by infected deer contaminating feeding sites with a disease agent.

The results show that supplemental feeding or baiting poses potential for disease transmission and environmental contamination due to greater deer use and concentration at food sources. These results indicate that restrictions on feeding quantity are not likely to be effective in reducing the potential for disease transmission.

Reward Payments End

Focus on Positives, a program that rewarded $200 to the owner of land where a CWD-positive deer was shot and $200 to the hunter who harvested the deer, has been discontinued this year.

While the money was appreciated by those receiving the checks, surveys of hunters and landowners in the DEZs have shown that the program was not an incentive that encouraged greater harvests of deer in the immediate vicinity of CWD-positives as initially intended.

The DNR will continue exploring the possibilities of a program that will serve as an incentive for landowners and hunters to assist in the disease management effort for future years.

Why Do So Few CWD-Positive Deer Appear Sick?

CWD poses a challenge to landowners, hunters, researchers and wildlife managers alike. Although the disease is always fatal, the majority of infected deer don't initially appear sick. There are many reasons why we see so few deer displaying the clinical signs of this disease.

Probably the most significant reason is the disease's long latency period. Although deer are believed to transmit CWD soon after they become infected, it can take as long as 18-24 months from infection to when clinical signs appear.

Since it takes time for a deer to become infected and many deer that are younger than 24 months old are harvested by hunters or killed by motor vehicles every year, most infected deer are killed before they reach the point of exhibiting any signs.

Also significant is that when deer are sick, they usually head for areas that provide them with ample cover while they attempt to recuperate. A good example of this is when a deer has been wounded by a bullet or an arrow. If they are capable of heading for cover, they usually bed down where it isn't easy to retrieve or, sometimes, even spot them. Also, since one of the clinical signs of CWD is excessive thirst, infected deer may head toward wet areas where they can find water.

Finally, though not a major source of deer mortality in the southern portion of the state, predation by animals such as coyotes is also a factor. Most predators have the ability to recognize a sick animal long before humans can.

Simply put, most CWD-positive deer are harvested or struck by a motor vehicle before they exhibit any clinical signs, and the ones that do appear sick are most likely to be in areas where they aren't highly visible.

Malnutrition or other illnesses that affect white-tailed deer may also cause the same clinical signs that are associated with CWD. One example is Cranial Abscessation Syndrome, which is a bacterial disease that infects the deer's brain.

Both deer pictured above were CWD-positive and exhibited some clinical signs associated with the disease. Notice the extreme emaciation, head held in a lowered position, drooping ears and blank facial expression. Also, the buck pictured has approached someone's patio to drink from a bird bath, which indicates excessive thirst.

These are not the only signs of CWD, however. Most deer that have had the disease long enough may begin to exhibit some or all of the following clinical signs as well:

- excessive salivation and drooling
- loss of appetite
- progressive weight loss and extreme emaciation
- excessive thirst and urination
- listlessness
- teeth grinding

If you observe a deer that is more than one year of age and shows signs listed above, contact your local DNR office right away. DNR staff will try to assess the condition of the deer and their collection options for CWD testing. Replacement tags are available to hunters who harvest and submit deer with signs compatible with CWD to the DNR .

Testing Outside of the CWD Zones

Disease surveillance statewide is an essential part of managing CWD. As we continue to work to control the disease in both free-ranging and farmed herds, it is critical to monitor for introduction of it into new areas of the state.

Because of this, currently a different region of the state, where CWD is not known to exist, is sampled each year. The DNR's goal for this effort is to continue to increase confidence in our ability to say the disease is not likely to be present in a certain area.

For the 2006 deer seasons, samples are being collected in the west-central region and in areas of the south-central and south-east regions that are not in either a DEZ or the Herd Reduction Zone (HRZ).

These regional areas have been split into sampling units with a goal of 500 samples each. Though in some instances two counties are combined to form a sampling unit, most units are one entire county.

This sampling intensity allows a 95 percent confidence that CWD would be detected if as few as one percent of deer are infected.

This year, a major effort to sample deer outside of the CWD zones will take place in the shaded areas above.

Deer Registration, Sampling and Donation

Eastern DEZ Registration and Sampling Stations

Wild Images	Burlington	**M-F** 8 am-5:30 pm, **Sat.** 8 am-1 pm, **Sun.** 9 am-noon
Nelson's Corners Inn	Delavan	**Daily** 10 am-8 pm, **Holidays**: Call ahead (262) 724-5454
Chad's Taxidermy	Clinton	**Daily** 9 am-6 pm, **Closed Thanksgiving and Christmas**
Big Foot Beach State Park [1]	Lake Geneva	**Oct 23-Nov. 19:** 8 am-7 pm, **Nov. 20-Dec 10:** 8 am-6 pm, **Dec 11-Jan 8:** 9 am-12 pm, **Dec 24:** 8 am-4 pm, **Closed Thanksgiving and Christmas**

Western DEZ Registration and Sampling Stations

Norslein's Wood Works [1]	Black Earth	**Oct. 26-Nov. 18:** 8 am-8 pm, **Nov. 19-Jan. 7:** 8 am-7 pm
Black Earth Meats [1]	Black Earth	**M-F** 7 am-7pm, **Sat.** 8 am-5 pm, **Sun.** 10 am-3 pm
Dick's Quality Meats [1]	Blue Mounds	**Daily** 6 am-9 pm
Eagle Mart Stop-n-Go/BP [1]	Barneveld	**Oct. 26-Nov. 18:** 8 am-8 pm, **Nov. 19- Jan. 7:** 8 am-7 pm
Jumpin' Jupiter General Store	Dodgeville	**M-Th** 8:30 am-8:30 pm, **Fri.** 8:30 am-10 pm, **Sat.** 6:30 am-10 pm, **Sun.** 6:30 am-7 pm
Countryside Lanes [1]	Hollandale	**Oct. 26-Nov. 18:** 8 am-8 pm, **Nov. 19- Jan. 7:** 8 am-7 pm
Hoesly's Meats, Inc. [1]	New Glarus	**M-F** 8 am-5 pm, **Sat.** 8 am-3 pm
Woody's	Spring Green	**M-Th.** 9 am-8 pm, **F-Sat**. 9 am-9 pm, **Sun.** 9 am-7 pm
Franklin Town Hall [1]	Plain	**Oct. 26-Nov. 18:** 8 am-8 pm, **Nov. 19- Jan. 7:** 8 am-7 pm
Palan's Outpost Sporting Goods	Highland	**Tues.-Sun.** 7 am-6 pm
Lower WI State Riverway, HWY 14	Lone Rock	**Nov. 18-26:** 8 am-8 pm
Boat landing, HWY 80 and River Road	Muscoda	**Nov. 18-26:** 8 am-8 pm
Five Point Cheese and Liquor [2]	Mineral Point	**Daily** 8 am-8 pm
Husie's Bar [2]	Blanchardville	**Nov. 18-19:** 5 pm- 12 am
Ace Hardware [2]	Sauk City	**Nov. 18:** 8 am-6:30 pm **Nov. 19:** 9 am-5 pm
Oar House [3]	Lone Rock	**Tues.-Sun.** 6 am-6 pm, **Closed Nov. 18-26**
Ott Haus Pub and Grill [3]	New Glarus	**Daily** 10 am-8 pm
Lodi One Stop [3]	Lodi	**Daily** 6 am-10 pm

[1] **Accepting pantry deer**

[2] **Collecting samples on Nov. 18 and 19 only**

[3] **Registration Only**

Hunters are encouraged to harvest more deer than they can eat and donate excess venison to the food pantry program. To do this, bring your field dressed deer to a participating registration and sampling station or participating meat processor. Additional participating meat processors are listed here: http://dnr.wi.gov/org/land/wildlife/damage/donation/cwddonation.htm.

Wisconsin Department of Natural Resources Contacts

DNR Web site:
http://dnr.wi.gov

DNR CWD pages:
http://dnr.wi.gov/org/land/wildlife/whealth/issues/CWD/index.htm

DNR toll-free CWD information line:
1-877-WISC CWD or **1-877-947-2293**
8 am-4 pm Monday-Friday

DNR Bureau of Wildlife Management:
608-266-8204

Other Wisconsin State Agency Contacts

Department of Agriculture, Trade and Consumer Protection
Office of Outreach and Policy/Animal Health and Safety Issues

608-224-5130

datcp.state.wi.us
keyword: chronic wasting disease

Department of Health and Family Services

608-267-7321

dhfs.wisconsin.gov/communicable/Communicable/factsheets/creutzfeldt.htm

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